



Lab 1

1. You have developed a measure of motivation that ranges from 0 = no motivation to 100 = "extremely high" motivation. (Assume this to be an interval scale.) To try out your measure, you randomly sample 12 social science graduate students at ISU. Their scores are:

Men: 55, 49, 72, 73, 45
 Women: 61, 83, 23, 37, 51, 57, 67

- a. What is the range for all 12 scores?
- b. What is the median motivation score for the 12 students?
- c. What is the estimate of the population mean for women?
- d. Calculate the following:

$$\sum_{i=1}^{12} \frac{X_i}{12}$$

$$\frac{1}{12} \sum_{i=1}^{12} X_i$$

$$\frac{1}{12} \sum_{i=1}^{12} (X_i - \bar{X})^2$$

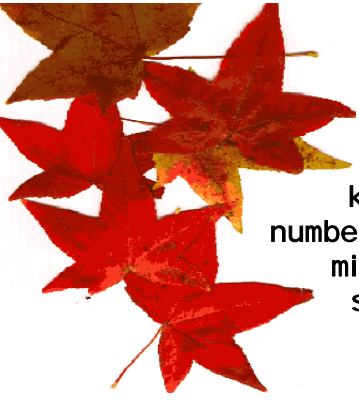
$$\frac{1}{2} \sum_{i=6}^7 X'_i$$

$$\frac{1}{2} \sum_{i=3}^4 |X'_{i+6} - X'_i|$$

(In the last two expressions, X'_i are X_i after they have been ordered by magnitude.)

- e. Which statistics do each of these numbers (i.e., the ones calculated in part d) represent?
- f. Demonstrate with the above data that

$$\sum_{i=1}^{12} X_i^2 \neq \left(\sum_{i=1}^{12} X_i \right)^2$$



2. Solve both of the following for k . (Hints: Assume that k is a constant. Part a has a solution for k that is a real number; part b does not. Also, as an additional challenge you might (optionally) try checking your solution to part b by substituting it back into the original equation.):

$$\text{a. } k = \sum_{i=1}^7 3$$

$$\text{b. } \sum_{i=1}^n (X_i - k)^2 = nk^2$$

Lab Assignment